Supplemental Material: The Role of Helical and Non-Helical Drives on the evolution of Self-Consistent Dynamos

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I. SUPPLEMENTARY MOVIE 1

Dynamics of three-dimensional magnetic field iso-surfaces for a helical dynamo in the kinematic stage and saturated stage at magnetic Prandtl number (P_m) 2. The magnetic fields in the saturated stages exhibit structures larger than those in the kinematic stages. The dynamo is essentially a small-scale dynamo (SSD). The volume rendering visualization is conducted using a linear scale. Simulation details: triply periodic box of length $L_x = L_y = L_z = 2\pi$, grid resolution = 256^3, time stepping (dt) = 10^{-4}.

II. SUPPLEMENTARY MOVIE 2

Dynamics of three-dimensional magnetic field iso-surfaces for a helical dynamo in the kinematic stage and saturated stage at magnetic Prandtl number (P_m) 1. The magnetic fields in the saturated stages exhibit structures larger than those in the kinematic stages. The dynamo is essentially a small-scale dynamo (SSD). The volume rendering visualization is conducted using a linear scale. Simulation details: triply periodic box of length $L_x = L_y = L_z = 2\pi$, grid resolution = 256^3, time stepping (dt) = 10^{-4}.

III. SUPPLEMENTARY MOVIE 3

Dynamics of three-dimensional magnetic field iso-surfaces for a helical dynamo in the kinematic stage and saturated stage at magnetic Prandtl number (P_m) 0.25. The magnetic fields in the saturated stages exhibit structures larger than those in the kinematic stages. The dynamo is essentially a small-scale dynamo (SSD). The volume rendering visualization is conducted using a linear scale. Simulation details: triply periodic box of length $L_x = L_y = L_z = 2\pi$, grid resolution = 256^3, time stepping (dt) = 10^{-4}.

IV. SUPPLEMENTARY MOVIE 4

Dynamics of three-dimensional magnetic field iso-surfaces for a non-helical dynamo in the kinematic stage and saturated stage at magnetic Prandtl number (P_m) 2. The magnetic fields in the saturated stages exhibit structures larger than those in the kinematic stages. The dynamo is essentially a small-scale dynamo (SSD). The volume rendering visualization is conducted using a linear scale. Simulation details: triply periodic box of length $L_x = L_y = L_z = 2\pi$, grid resolution = 256^3, time stepping (dt) = 10^{-4}.

V. SUPPLEMENTARY MOVIE 5

Dynamics of three-dimensional magnetic field iso-surfaces for a non-helical dynamo in the kinematic stage and saturated stage at magnetic Prandtl number (P_m) 1. The magnetic fields in the saturated stages exhibit structures larger than those in the kinematic stages. The dynamo is essentially a small-scale dynamo (SSD). The volume rendering

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visualization is conducted using a linear scale. Simulation details: triply periodic box of length $L_x = L_y = L_z = 2\pi$, grid resolution = 256^3, time stepping (dt) = 10^{-4}.

VI. SUPPLEMENTARY MOVIE 6

Dynamics of three-dimensional magnetic field iso-surfaces for a non-helical dynamo in the kinematic stage and saturated stage at magnetic Prandtl number (P_m) 0.25. The magnetic fields in the saturated stages exhibit structures larger than those in the kinematic stages. The dynamo is essentially a small-scale dynamo (SSD). The volume rendering visualization is conducted using a linear scale. Simulation details: triply periodic box of length $L_x = L_y = L_z = 2\pi$, grid resolution = 256^3, time stepping (dt) = 10^{-4}.